Technical corrections of: Characterizing aerosol sources based on aerosol optical properties and dispersion modelling in a Scandinavian Coastal Area (Aarhus, Denmark)

We would like to thank the reviewer for these technical corrections. We have addressed the comments in a point-by-point fashion below and revised the manuscript accordingly. Our answers to the comments are given below in blue letters**,** while the reviewer comments are given in *black italics*.

2nd Review.
Comments to the manuscript "Characterizing aerosol sources based on aerosol optical properties and dispersion modelling in a Scandinavian Coastal Area (Aarhus,Denmark)" by the authors Zihui Teng, Jane Tygesen Skonager, et al.

I thank the Authors of the paper for having addressed the 2nd Reviewer's and all my initial comments in such an exhaustive manner. I find that the quality of the manuscript has improved greatly. However, I have some last pressing issues concerning the use and the description of the Aethalometer Model.

The authors should consider adding a comment on why they chose Absorption Ångström Exponents to be αff = 1 and αbb = 2. In the literature, many studies have been published concerning the use of optimised AAE values. Indeed, an incorrect choice of the parameters – and especially an incorrect choice of αff – can lead to non-robust apportionment results.

Indeed, the selection of α_{ff} and α_{bb} is very important. In the literature values of α_{ff} close to 1 are most commonly found as being representative for fossil fuel combustion particles, while values for α_{bb} mostly vary between 1.6 – 2.2 and are strongly dependent on the type of biomass burning and burning conditions (e.g., Sandradewi et al. 2008, Zotter et al. 2017). Typically, auxiliary measurements of ^{14}C, EC/OC and a levoglucosan tracer have been used to find the best α_{ff} and α_{bb}. As these were, however, not available in our study and no comparable datasets evaluating these coefficients at close locations have been published so far, we chose to use the values of α_{ff} = 1 and α_{bb} = 2 as proposed by the manufacturer.
We have added information on the choice of the exponents in the SI-part describing the Aethalometer model.

Additionally, in the supplementary material equations (0.1) (0.2) and (0.5) are incorrect. Equations (0.1) and (0.2) need a minus sign at the exponent and equation (0.5) is not a sum it is fraction.

We thank the reviewer for spotting these mistakes that have now been corrected in the revised SI.

Lastly, why are the authors carrying out BC apportionment by multiplying BC(880nm) by the calculated BB% at 950nm? Optical apportionment carried out at one wavelength does not carry over to another wavelength so easily. Could the authors address and solve this issue?

We thank the reviewer for this comment. We agree with the reviewer that the choice of the wavelength matters. We have chosen the range specified by Sandradewi et al. 2008 due to the explanation given in the paper stating that the model requires a large, robust spectral range to accurately isolate fossil fuel burning (traffic) from biomass burning. Thus, the maximal wavelength of 950 nm is chosen for the calculation of $b_{abs,bb}$ and further used to calculate BB%.